

WHAT IS CLAIMED IS:

1. A temperature compensation system for a laser, the temperature compensation system comprising:
 - a laser driver having a first potentiometer, the laser driver configured to provide a first signal to a laser based on a value of the first potentiometer;
 - an optical communication analyzer configured to provide a second signal indicative of a first output parameter of the laser; and
 - a computer system configured to drive the first signal and receive the second signal and determine a first updated value for the first potentiometer to obtain a first desired laser output parameter value based on a first known value of the first potentiometer, the second signal, and the first desired laser output parameter value.
2. The temperature compensation system of claim 1, wherein the laser driver has a second potentiometer, the laser driver is configured to provide a third signal to the laser based on a value of the second potentiometer; the optical communication analyzer is configured to provide a fourth signal indicative of a second output parameter of the laser; and the computer system is configured to drive the third signal and receive the fourth signal and determine a second updated value for the second potentiometer to obtain a second desired laser output parameter value based on a second known value of the second potentiometer, the fourth signal, and the second desired laser output parameter value.
3. The temperature compensation system of claim 2, wherein the first signal comprises a bias current signal and the third signal comprises a modulation current signal.
4. The temperature compensation system of claim 2, wherein the first output parameter of the laser comprises an average power and the second output parameter of the laser comprises an extinction ratio.

5. The temperature compensation system of claim 2, wherein the first desired laser output parameter comprises an average power and the second desired laser output parameter comprises an extinction ratio.
6. A computer system comprising:
 - a memory storing a temperature compensation program; and
 - a processor, which executes the temperature compensation program instructions to:
 - select a first setting for a first potentiometer for controlling a bias current of a laser diode;
 - receive a measurement of an average power of the laser diode;
 - and
 - calculate a second setting for the first potentiometer based on the first setting for the first potentiometer, the measurement of the average power, and a desired average power.
7. The computer system of claim 6, wherein the processor executes the temperature compensation program instructions to:
 - select a third setting for a second potentiometer for controlling a modulation current of the laser diode;
 - receive a measurement of an extinction ratio of the laser diode; and
 - calculate a fourth setting for the second potentiometer based on the third setting for the second potentiometer, the measurement of the extinction ratio, and a desired extinction ratio.
8. The computer system of claim 6, wherein the processor executes the temperature compensation program instructions to set the temperature of the laser diode to a selected value.

9. The computer system of claim 6, wherein the processor executes the temperature compensation program instructions to store the second setting in the memory.

10. The computer system of claim 7, wherein the processor executes the temperature compensation program instructions to store the fourth setting in the memory.

11. A method for compensating for temperature variations of a laser diode comprising:

- selecting a first setting for a first potentiometer for controlling a bias current of a laser diode;
- measuring an average power of the laser diode; and
- calculating a second setting for the first potentiometer based on the first setting for the first potentiometer, the measured average power, and a desired average power.

12. The method of claim 11, further comprising:

- selecting a third setting for a second potentiometer for controlling a modulation current of the laser diode;
- measuring an extinction ratio of the laser diode; and
- calculating a fourth setting for the second potentiometer based on the third setting for the second potentiometer, the measured extinction ratio, and a desired extinction ratio.

13. The method of claim 11, further comprising:

- setting the temperature of the laser diode to a selected value.

14. The method of claim 12, wherein the first potentiometer is a first digital potentiometer and the second potentiometer is a second digital potentiometer.

15. The method of claim 12, further comprising:

installing the laser diode in a transmitter; and
storing the second setting for the first potentiometer and the fourth setting for the second potentiometer to a memory of the transmitter.

16. The method of claim 12, further comprising:
installing the laser diode in a transmitter;
selecting a first thermistor of the transmitter based on the second setting for the first potentiometer; and
selecting a second thermistor of the transmitter based on the fourth setting for the second potentiometer.

17. The method of claim 12, wherein calculating the fourth setting for the second potentiometer comprises the following equation:

$$R_2 = \left(\frac{10^{ERdB_2/10} + 1}{10^{ERdB_2/10} - 1} \right) \cdot \left(\frac{10^{ERdB_1/10} - 1}{10^{ERdB_1/10} + 1} \right) \cdot R_1$$

where R_2 is the fourth setting for the second potentiometer, R_1 is the third setting for the second potentiometer, $ERdB_2$ is the desired extinction ratio in dB, and $ERdB_1$ is the measured extinction ratio in dB.

18. The method of claim 11, wherein calculating the second setting for the first potentiometer comprises the following equation:

$$R_2 = \frac{P_{1ave}}{P_{2ave}} \cdot R_1$$

where R_2 is the second setting for the first potentiometer, R_1 is the first setting for the first potentiometer, P_{2ave} is the desired average power, and P_{1ave} is the measured average power.

19. A computer readable medium for use in a computer system comprising:
a computer readable program code means for causing a computer to:
select a first setting for a first potentiometer for controlling a bias current of a laser diode;

receive a measurement of an average power of the laser diode;
and

calculate a second setting for the first potentiometer based on the
first setting for the first potentiometer, the measurement of the average
power, and a desired average power.

20. The computer readable medium of claim 19, wherein the computer
readable program code means comprises code means for causing a computer to:
select a third setting for a second potentiometer for controlling a
modulation current of the laser diode;

receive a measurement of an extinction ratio of the laser diode; and

calculate a fourth setting for the second potentiometer based upon the
third setting for the second potentiometer, the measurement of the extinction
ratio, and a desired extinction ratio.

21. The computer readable medium of claim 19, wherein the computer
readable program code means comprises code means for causing a computer to:
set the temperature of the laser diode to a desired value.

22. A fiber optic transmitter comprising:

a laser;

a first potentiometer for controlling a bias current of the laser; and

a second potentiometer for controlling a modulation current of the laser,

wherein a first value of the first potentiometer is set for a specific

temperature by:

selecting a second value for the first potentiometer;

measuring an average power of the laser; and

calculating the first value for the first potentiometer based on the
second value for the first potentiometer, the measured average power,
and a desired average power;

and wherein a third value of the second potentiometer is set for the
specific temperature by:

selecting a fourth value for the second potentiometer;
measuring an extinction ratio of the laser; and
calculating the third value for the second potentiometer based on
the fourth value for the second potentiometer, the measured extinction
ratio, and a desired extinction ratio.

23. The fiber optic transmitter of claim 22, wherein the first potentiometer is a first mechanical potentiometer and the second potentiometer is a second mechanical potentiometer.

24. The fiber optic transmitter of claim 22, wherein the first potentiometer is a first digital potentiometer and the second potentiometer is a second digital potentiometer.

25. The fiber optic transmitter of claim 24, wherein a first position of the first digital potentiometer is stored in a memory of a transmitter and a second position of the second digital potentiometer is stored in the memory of the transmitter.

26. The fiber optic transmitter of claim 22, wherein the first value of the first potentiometer is stored in a memory of a transmitter and the third value of the second potentiometer is stored in the memory of the transmitter.

27. The fiber optic transmitter of claim 26, wherein the memory is an electrically erasable programmable read-only memory.

28. The fiber optic transmitter of claim 22, wherein the laser is a laser diode.